Asthma

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Asthma

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This is the third in a series of occasional articles featuring BMJ Masterclasses. These are designed to provide general practitioners with up to date information on managing common medical problems. For more information, contact Dr Cath McDermott, editor of BMJ Masterclasses (CMcDermott@bmjgroup.com), and see www.bmjmasterclasses.com

The prevalence of active asthma in the United Kingdom is 5.8% according to data from the quality and outcomes framework of the new general medical services contract (which allocates 45 points for caring for patients with asthma). There are still about 1500 deaths a year from asthma in the UK, many of which may be preventable, and asthma affects about eight million people in the UK at some stage in their lives.

What should I already know about this condition?

Asthma is a variable condition. You can make the diagnosis by noting a history of variable symptoms, confirmed by variability of peak flow (or spirometry):

- ≥20% variability in peak expiratory flow rate (PEFR) (≥60 l/min) on three days in a week for at least two weeks
- ≥20% improvement in PEFR (or 15% with a 200 ml improvement in forced expiratory volume in one second (FEV_1)) after treatment—for example, 10 minutes after inhalation of high dose β_2 agonist (through a spacer)
  After a six week course of inhaled corticosteroids
  After 14 days of 30 mg prednisolone
- ≥20% decrease in PEFR after challenge with a trigger factor (such as after exercise).

What new evidence do I need to know about?

Telephone reviews

Building on a previously published trial,[1] this study randomised 194 adults with asthma in the south west of England to telephone review or surgery review over 12 months.[2] Patients in the telephone group were contacted every six months and asked the Royal College of Physicians' three morbidity index questions plus two other questions about hospital admissions and treatment in intensive care. An action plan was agreed for those considered to be at low risk. A surgery appointment was arranged if the patient answered "yes" to any of the questions.

Control of asthma was similar in both groups, with a mean cost of £210 per patient per year in the telephone group compared with £334 in the clinic group.

Bottom line—Telephone reviews may be as effective as face to face reviews and are cost effective, so it is surprising that telephone review is not permitted under the quality and outcomes framework. The rationale is that inhaler technique cannot be checked over the telephone.

PRACTICAL TIPS

- Ask specific questions about asthma control, such as the Royal College of Physicians' three questions: people who are used to living with asthma tend not to volunteer their symptoms unless asked specifically
- Step up treatment if symptoms are not controlled: step down if your patient's asthma is stable
- People who learn how to control their asthma are less likely to have exacerbations. Every encounter with medical services is an opportunity to review, reinforce, and extend patients' knowledge and skills
- Patients' action plans should include details of their asthma drugs, advice about when to take further action, what to do if symptoms get worse, when to return to usual doses, and when to seek urgent medical help
- Rhinitis is a very common comorbidity. Ask patients with asthma about nasal symptoms, and ask patients with rhinitis about wheeze

IMPACT trial

In this study 225 adults with mild asthma who did not smoke were randomised to one of three treatment arms—regular budesonide, regular oral zafirlukast (20 mg twice daily), or intermittent use of inhaled budesonide.[3] Primary outcome was peak flow measured in the morning.

Patients in all three groups had similar increases in morning peak flow (of about 7.8%) and similar rates of exacerbations, though those taking intermittent treatment experienced more symptoms and markers of bronchial inflammation. Patients using intermittent treatment took budesonide for an average of only 0.5 weeks a year.

Bottom line—This is an exploratory study, which needs to be confirmed, but it raises the possibility that some patients with mild persistent asthma could be treated with short, intermittent courses of inhaled steroids.

How many patients with asthma have rhinitis?

This study, of 7219 patients with asthma in the UK, found that 76% reported symptoms of rhinitis (blocked or runny nose, itchy eyes, and sneezing).[4] Of this 76%, half said that their rhinitis made their asthma worse,

58% reported seasonal rhinitis whereas the others reported constant symptoms, and only 54% were being prescribed a nasal corticosteroid.

Bottom line—There is growing evidence of the importance of the overlap between rhinitis and asthma. You should ask all patients with asthma if they have symptoms of rhinitis.

The salmeterol multicentre asthma research trial

This trial found that salmeterol may increase the risk of severe and life threatening exacerbations of asthma, especially in African-American patients, and in those who are not prescribed concomitant inhaled corticosteroids.[5 6] Whether this risk is due to genetic factors, or patient behaviours leading to poor outcomes is not known.

Bottom line—Long acting β agonists are effective in reducing asthma symptoms, but clinicians should prescribe, and patients be counselled to take, concomitant inhaled corticosteroids.

Cochrane review

This review looked at all randomised controlled trials that included children older than 2 years who were given inhaled β_2 agonists for chronic cough (that is, cough lasting more than three weeks).[7] Salbutamol showed no benefit over placebo.

Bottom line—Salbutamol may not be useful for children with chronic cough.

Summary of the British Thoracic Society (BTS) and the Scottish Intercollegiate Guidelines Network (SIGN) guidance on managing asthma[8]

Step 1—Mild intermittent asthma

- Inhaled short acting β_2 agonist as required

Step 2—Regular prophylactic therapy

- Add inhaled corticosteroid, starting at dose appropriate to severity of asthma
- Children aged <5 years—Start at dose equivalent to beclometasone 200-400 µg/day (though a higher nominal dose may be needed if drug delivery is difficult) or, if inhaled corticosteroid cannot be used, start a leucotriene receptor antagonist
- Children aged 5-12 years—Start at dose equivalent to beclometasone 200-400 µg/day (200 µg is appropriate for many patients) or, if inhaled corticosteroid cannot be used, start another prophylactic drug
- Teenagers and adults—Start at dose equivalent to beclometasone 200-800 µg/day (400 µg is appropriate for many patients)

Step 3—Additional therapy

- Children aged <2 years—Consider referring to a respiratory paediatrician
- Children aged 2-5 years—Consider trial of leucotriene receptor antagonist
- Older children and adults—Add inhaled long acting β_2 agonist and assess response:

  If good response, continue treatment

  If some response but asthma control still inadequate, increase inhaled corticosteroid dose to equivalent of 400 µg (if not already at this dose)

  If no response, stop long acting β_2 agonist, increase inhaled corticosteroid dose to equivalent of 400 µg, and, if necessary, start trial of other additional therapy (such as leucotriene receptor antagonist or slow release theophylline)

Step 4—Persistent poor control

- Children aged <5 years—Refer to respiratory paediatrician
- Children aged 5-12 years—Increase inhaled corticosteroid dose to equivalent of ≤800 µg
- Teenagers and adults—Consider trials of:

  Increasing inhaled corticosteroid dose to equivalent of ≤2000 µg

  Adding a fourth drug such as leucotriene receptor antagonist, slow release theophylline, or oral β_2 agonist

Step 5—Continuous or frequent use of oral corticosteroids

- Patients whose asthma is still not controlled should be referred to a specialist for assessment and consideration of further options including high dose inhaled corticosteroids, frequent or regular oral corticosteroids, and anti-E immunoglobulin

What new guidelines have been produced in the past two years?

The British Thoracic Society (BTS) and Scottish Intercollegiate Guidelines Network (SIGN) guidelines on the management of asthma with web based annual updates

See box for management advice based on these guidelines.[8] Important points are

- Introduce inhaled corticosteroids if patients have
  - Had an exacerbation of their asthma in the past two years
  - Symptoms needing a β agonist at least three times a week
  - Symptoms at least one night a week
- Exercise induced asthma is often a sign of poor control
- Inhaled corticosteroids are thought to be safe to a maximum daily dose equivalent to <800 µg beclometasone for adults and <400 µg for children. At regularly higher doses, adults may be at increased risk of osteoporosis, and children may be at risk of short term growth suppression or adrenal insufficiency
- Long acting β agonists are now used at step 3 (see box) instead of increasing the inhaled corticosteroid dose further.
- Self management plans are important. About 90% of asthma exacerbations occur relatively slowly. For example, it is common to have symptoms during the night for several nights before hospital admission
- Using a pressurised metered dose inhaler and spacer is at least as good as a nebuliser for treating mild and moderate exacerbations
- Occupational asthma accounts for 9-15% of adult onset asthma. You should ask adults with new onset asthma or re-emergence of childhood asthma if their symptoms improve on days away from work. If so, refer them to an occupational health doctor.

Practical management tips

Aim to keep your patient on the lowest effective dose of inhaled corticosteroid that will prevent symptoms. Inhaled corticosteroids are often used in inappropriate doses.

If your patient's asthma is well controlled you should step down treatment (reduce the dose by 25-50% every three months). Only 5-10% of people with asthma will need high dose corticosteroids.

Equally, concordance with use of regular inhaled corticosteroids is poor, and many patients are undertreated.

Use the three morbidity index questions recommended by the Royal College of Physicians to assess symptoms of asthma in the past week or month:

Commonly asked questions—answered by our experts

At what age can we safely diagnose asthma (as opposed to viral induced wheeze) in a toddler?
It is difficult to be certain whether a wheezy toddler has asthma, but you should consider following a structured diagnostic process:

- An appropriate history—Episodic cough and wheeze, especially with a personal or family history of atopy, are suggestive. Viral associated wheeze is often related to passive smoking and other causes of babies being small for their birth date
- Objective evidence—Lung function tests are impractical, so wheeze heard by a healthcare professional should be noted as objective confirmation of the parents' description
- Response to treatment—Improvement in symptoms supports a diagnosis of asthma, but subsequent withdrawal of treatment is necessary to exclude coincidental improvement. A clear response to bronchodilation is helpful, but for more chronic symptoms a course of inhaled corticosteroids will be more appropriate. The starting dose suggested for children may need to be increased for infants because of the practical problems of delivering adequate doses to the lung: some authors suggest up to 800 µg daily for two months.[10] A poor response suggests that asthma is unlikely and you can stop treatment.

Should we double inhaled corticosteroids as part of an asthma action plan?
Empowering people to adjust their dose of inhaled corticosteroid in response to symptoms or peak flows is an effective part of action plans.[11] In the real world, where patients reduce or even stop their inhaled corticosteroids between exacerbations, it is appropriate to remind patients to reinstate prophylactic treatment when their asthma control deteriorates. For patients with low maintenance doses of inhaled corticosteroids, the dose should be increased substantially if control worsens. Patients with more severe asthma who are already regularly taking high doses of inhaled corticosteroids may be better advised to start oral corticosteroids.

What are the alternatives to long acting β agonists as additional therapy?
Before increasing treatment, assess the clinical situation, checking diagnosis, inhaler technique, concordance with treatment, possible environmental triggers and concomitant rhinitis.
The BTS-SIGN guidelines recommend long acting β agonists as the first choice for additional therapy for adults and older children. This statement does not, however, take into account the complexity of tailoring treatment to individual circumstances.

- In light of recent concerns about increased risk of severe asthma attacks in patients taking long acting β agonists, it is important to optimise inhaled corticosteroid treatment
- Leucotriene antagonists can reduce the symptoms of rhinitis, and so may be particularly suitable as additional therapy for patients whose asthma has slipped out of control during the hay fever season
- Both long acting β agonists and leucotriene antagonists effectively reduce exercise induced asthma. A patient's preference for a tablet or an inhaler may be an important factor when choosing a treatment
- In preschool children long acting β agonists seem to be less effective, and leucotriene antagonists may be the better option

- "Have you had your usual asthma symptoms during the day, such as cough, wheeze, chest tightness, or breathlessness?"
- "Have you had any difficulty sleeping because of your symptoms, including cough?"
- "Has your asthma interfered with your usual activities (such as housework, work, or school)?"

Measuring PEFR is a useful tool for making a diagnosis, and assessing how well a patient's asthma is controlled. It is essential in objectively assessing the severity of an acute attack, when it should be compared with the patient's best achieved peak flow.

Ideally, all adults should have their best peak flow measured every five years to compensate for decreasing lung function with age. Children who are still growing should be assessed more frequently—for example, as part of an annual asthma review.

Include the following information in a patient's action plan: details of asthma drugs including names, doses, and side effects; advice about when to take further action (for example, based on the pattern of their symptoms or peak flow measurements); what to do if symptoms get worse; when to return to usual doses; and when to seek urgent medical help.

Increasing the dose of inhaled corticosteroid during an exacerbation is an essential component of successful asthma action plans. One study showed that increasing the dose fivefold was effective.[9]

Rhinitis is a common comorbidity. Ask patients with asthma about nasal symptoms, and ask patients with rhinitis about wheeze.

Consider keeping a register of high risk patients with asthma. These include those who have been admitted to hospital with asthma in the past year, those with "brittle" asthma (condition tends to deteriorate rapidly during an exacerbation with little warning), and those who have ever been admitted to an intensive care unit with asthma.

It is marginally cheaper to prescribe combined corticosteroid and long acting β_2 agonist inhalers rather than prescribing them individually, and this prevents the potential danger of non-compliance with the inhaled steroid. However, it prevents the flexibility of adjusting the dose of the drugs independently.

When should I refer my patient?

You should refer your patient if you are unsure of the diagnosis, especially in infants, or if you suspect that asthma may be related to your patient's working conditions (occupational asthma).

It is also reasonable to refer if asthma control is not achieved by stepping up treatment to step 4 (adults and children) or step 3 (children under 5 years) see Summary of the British Thoracic Society (BTS) and the Scottish Intercollegiate Guidelines Network (SIGN) guidance.

Common pitfalls

Many people with asthma are not receiving their prescribed treatment because of poor concordance with regular treatment and poor inhaler technique. You should try to discuss concordance in a non-judgmental way and check that patients know how to use their inhaler correctly before you change their treatment. (The Asthma UK website (www.asthma.org.uk) has an interactive demonstration of inhaler technique.)

Do not underestimate seasonal asthma. There is a strong link between asthma and hay fever, and deaths from asthma in young adults peak during the pollen season.[12] You should advise these patients to ask for help early when their symptoms worsen, and tell them about the link between asthma and rhinitis.

There is often confusion between chest infections and acute asthma. Acute asthma is commonly triggered by viral infections or allergens. You should not routinely prescribe antibiotics.

Delaying treatment is the most common preventable factor in asthma related deaths. This is often because the doctor or patient underestimates severity. You should use and record objective measures of severity such as peak flow measurements.

Do not prescribe long acting β agonists for patients with asthma without also prescribing inhaled corticosteroids.

ADDITIONAL EDUCATIONAL RESOURCES

- British Thoracic Society: www.brit-thoracic.org.uk
- General Practice Airways Group: www.gpiag.org
- Asthma UK: www.asthma.org.uk
- Clinical Evidence: www.clinicalevidence.com
- Best Treatments: www.besttreatments.co.uk
- Drugs and Therapeutics Bulletin: www.dtb.org.uk
- Scottish Intercollegiate Guidelines Network: www.sign.ac.uk
- Royal College of Physicians: www.rcplondon.ac.uk
- NetDoctor: www.netdoctor.co.uk
- BMJ Learning: www.bmjlearning.com
  Asthma in adults: diagnosis
  Childhood asthma: diagnosis and treatment

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Don't give up

She was brought in one night from a distant health centre from our rural Tanzanian hospital. No fetal heart beat could be found, so the on-call doctor decided to allow nature to take its course. In the morning when I reviewed her I thought I heard a weak and rapid fetal heart beat. The mother was pale and sick, and we started to resuscitate her. She had no contractions and was only 5 cm dilated, so we agreed to take her to theatre to save the mother and possibly the baby.

Arriving in theatre, the anaesthetist looked at her and said he didn't think we should operate—he didn't relish a death on the table. She had indeed reached the gasping stage, seemed to gasp for the last time, and looked beyond our help. Believing that the baby might still be alive, I threw on some gloves and grabbed a knife. The patient had the typical peri-mortem look as I cut, there was no bleeding, and her flesh had the grey-white look of death. I removed two macerated babies followed by numerous clots, confirming a concealed abruption. With a deflated uterus giving her diaphragm space, the patient then gasped deeply, and the anaesthetist, his interest renewed, started vigorous resuscitation. I completed her hysterectomy as her uterus was beyond saving, and we poured blood into her.

Five days later she went home cheerful and pink. Resuscitation with a full uterus is supposed to be difficult, but even when it seems too late, keeping going can produce miraculous results. Don't give up.

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